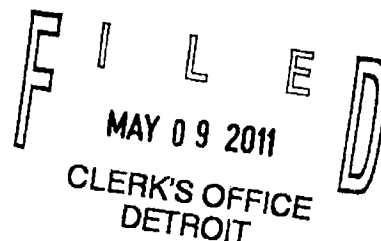


76

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN



Kristopher Dorr
Plaintiff(s)

v.

Civil No. 11-11542

Judicial Officer: Hon. Lawrence P. Zatkoff

Ford Motor Company
Defendant(s)

Kristopher Dorr
14633 Plymouth Rd. Unit 39
Detroit, MI. 48227
517-918-1294

Plaintiff's Objection to Judges Dismissing Complaint and

Motion for the court to reverse the decision, and remand this case back to the court

for a trial by jury and other relief

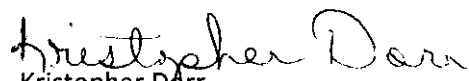
Kristopher Dorr who is represented Pro Se, Objects to the Dismissing of this Complaint and Motion for the court to reverse the decision, and remand for a trial by jury for the following reasons:

1. On April 11, 2011 Plaintiff filed Dkt. #1 Complaint and Motion for other Relief with factual claims of violations of the Genetic Information Nondiscrimination Act (GINA).
2. On April 11, 2011 Plaintiff filed Dkt. # 2 Request to proceed *In Forma Pauperis* with and affidavit pertaining to his assets.
3. On April 27, 2011 Judge Lawrence P. Zatkoff ruled in Plaintiff favor granting Application to proceed *In Forma Pauperis* but ruled against Plaintiff by Dismissing this Complaint. Dkt. #3.
4. Plaintiff is not and never was a prisoner at any time in his life. Plaintiff also notes that he does not work for a government entity, but is a Ford Motor Company employee. Therefore Title 28 U.S.C. Sec. 1915A was used in error.

**POOR QUALITY
ORIGINAL**

5. Plaintiff notes that Title 28 U.S.C. Sec. 1915(e) refers to the court requesting an attorney to represent any person unable to afford counsel. Plaintiff neither requested nor desire to be represented by an attorney appointed by this court.
6. Plaintiff notes that Title 42 U.S.C. Sec. 1197e(C)(1) refers to prisoners, Therefore this statute does not pertain to plaintiff as a person or this action brought before this court. Furthermore, Ford Motor Company is not immune from this civil action.
7. Plaintiff notes that in case no. 2:10-cv-13822 Kristopher Dorr v. Ford Motor Company, Judge Arthur J. Tarnow did not dismiss that action with substantially the same narrative. This court should not dismiss this action based on failure to state a claim.
8. In Paragraph 5 of the Judges response he clearly explains a hostile work environment just as in the narrative in Dkt. #1 Complaint and Motion for other Relief. Plaintiff's also wants to reiterate that he started at Ford Motor Company's Michigan Truck Plant in Wayne, MI. In 2001 he transferred to Romeo Engine Plant in Romeo, MI. In 2004 he transferred to Auto Alliance International in Flat Rock, MI. at no time in the statement did Plaintiff state or elude to working in St. Louis, MO.
9. Plaintiff also notes that the graffiti written on abandoned buildings in the City of Detroit indeed refer to his Hebrew national origin and that with all of the vandalism on abandoned buildings, this court has seen some of the graffiti mentioned in this complaint.
10. Plaintiff would like to cite evidence from Civil Action 92-0449 Akwei v. NSA., with regard to Remote Neural Monitoring. Plaintiff also notes that in case no. 2:10-cv-13822 exhibits on dockets #26 and 33 gives a detailed description on some of the materials used in the Remote Neural Monitoring Process.
11. Plaintiff informs this court that in H.R. 3200 prior to passage as P.L. 111-148, proposed amendments to the Federal Food, Drug and Cosmetic Act, under Subtitle C sec 2521(A)(1)(B), amending (g)(2)(A)&(B), (3)(A)(1)(i)&(B) calls for registry of data from disparate data environments. P.L. 111-148 sec. 1554(5) states that the Secretary of HHS shall not promulgate any regulation that violates informed consent.
12. P.L. 111-148 Sec. 3021(b) explains the content of records matched against Federal and State data including vital records, employment history, enrollment systems, tax records and other data deemed appropriate. Plaintiff did not give consent to anyone to acquire his genetic information for enrollment in any Federal or State Health and Human Services Programs.
13. Plaintiff informs the court that Title 28 U.S.C. sec. 1915(e) is inapplicable to this case because Plaintiff is not and never has been a criminal neither has Plaintiff been incarcerated in any State or Federal Penal Institution, inside or outside of the United States.

Wherefore, Plaintiff who is represented Pro Se, Objects to the Dismissal of this action and Motions the court review the decision, grant Plaintiff his Constitutional rights under the 7th Amendment and remand this complaint back to the court for a trial by jury and other relief.


Kristopher Dorr
Pro Se.

5/9/2011

Index of Exhibits

Exhibit A

1. Gale Cengage (Citing)

Evaluation of interactions of electric fields due to electrostatic discharge with human tissue
(Author Abstract)

2. Gale Cengage (Citing)

"Evaluation of interactions of electric fields due to electrostatic discharge with human tissue" (Comments and Replies) (Author Abstract)

3. Gale Cengage (Citing)

"Command Performance" Nature

Exhibit B

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2. British Dental Association (Citing)

Manchester Location

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AT&T forms health IT division

5. AMEDNEWS.COM (Citing)

U.S. plans to create massive medical claims database

6. AMEDNEWS.COM (Citing)

Electronic medical records: What your data can tell you

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1. Psychiatry's Shocking New Tools (Citing)

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3. Mind WorkStation (Citing)

Brainwave Entrainment Software for Professionals

Exhibit F

1. Mail Online (Citing)

Are U.S. government microwave mind-control tests causing TV presenters' brains to melt down?

2. Remote Neural Monitoring: A technology Used For Controlling Human Brain (Citing)

Exhibit A

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Evaluation of interactions of electric fields due to electrostatic discharge with human tissue
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"Command Performance" Nature



Title:Comments on "Evaluation of interactions of electric fields due to electrostatic discharge with human tissue".(Comments and Replies)(Author abstract)

Pub:*IEEE Transactions on Biomedical Engineering*

Detail:Ronald L. Seaman and James A. Comeaux Jr. 53.6 (June 2006): p1220(1).

Abstract:

Attention is drawn to recent paper by Rogers et al. (Aug., 2004) in which ultra-wideband pulses are applied to an isolated muscle as part of deriving a strength-duration curve for threshold stimulation. The paper extends the strength-duration threshold curve for unipolar pulses down to a pulse duration of about 1 ns, on the order of 1000 times shorter than previously studied. Results of the work justify use of traditional mathematical models of the strength-duration curve for nanosecond pulses, as done recently for the electric field resulting from electrostatic discharge through the body (Dawson, et al., 2004).

Index Terms--Electrostatic discharge, strength-duration curve. threshold, ultra-wideband pulse.

Source Citation

Seaman, Ronald L., and James A. Comeaux Jr. "Comments on 'Evaluation of interactions of electric fields due to electrostatic discharge with human tissue'." *IEEE Transactions on Biomedical Engineering* 53.6 (2006): 1220. *Health Reference Center Academic*. Web. 18 Mar. 2011.

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Title: Evaluation of interactions of electric fields due to electrostatic discharge with human tissue. (Author Abstract)

Pub: *IEEE Transactions on Biomedical Engineering*

Detail: T.W. Dawson, M.A. Stuchly and R. Kavet. 51.12 (Dec 2004): p2194(5).

Abstract:

Electrostatic discharges (ESDs) produce in the human tissue very strong electric fields of short duration. Possible biophysical interactions are evaluated by comparing the fields in subcutaneous fat/skin to the thresholds for peripheral nerve stimulation, and by computations of membrane potential and electric fields in cytoplasm of a typical cell in bone marrow. It is found that a 4-A peak ESD event is capable of stimulation of nerves located in subcutaneous fat of the lower arm of the hand eliciting a spark, with tens of kV/m and pulse duration of ~ 80 ns. For the same ESD event, the transmembrane potential (TMP) reaches 32 mV with a pulse duration of ~ 200 ns (half-width duration). The electric field in the cytoplasm of a bone marrow cell changes from about 8.8 kV/m to ~ 2 kV/m in about 200 ns.

Index Terms--Cytoplasm, electrostatic discharges, electric field, human body, membrane potential, neural stimulation.

Source Citation

Dawson, T.W., M.A. Stuchly, and R. Kavet. "Evaluation of interactions of electric fields due to electrostatic discharge with human tissue." *IEEE Transactions on Biomedical Engineering* 51.12 (2004): 2194+. *Health Reference Center Academic*. Web. 18 Mar. 2011.

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Date: Fri, March 18, 2011 5:52:26 PM
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Subject: Health Reference Center Academic:Command performance.

Jones, David. "Command performance." Nature. 388.n6643 (August 14, 1997): 630(1). Health Reference Center Academic. Gale. Norfolk Law Library. 18 Mar. 2011
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Abstract:

It has been hypothesized that pulsed magnetic fields used on selective parts of the human brain can actually reduce depression or affect motor control. Unlike electro-shock therapy, magnetic pulses of a precise frequency, shape and amplitude can theoretically be used to induce current in and therefore trigger a desired cluster of nerve fibers in a desired part of the body. Thus, pulsed magnetic fields can be used to trigger sensory nerves, block pain by inhibiting sensory nerves in specific areas or improve muscular strength and coordination.

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Exhibit B

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Dental Health Care

Dr Philip Wander
BDS MGDs RCS DFHom
Homeopathic Dentist

In Manchester

Tel 0161 834 1643

mercury free dentistry

mercury free dentistry



cosmetic | restorative | implants | preventive | mercury free | dietary guidelines

REPLACING AMALGAM (SILVER/MERCURY) FILLINGS

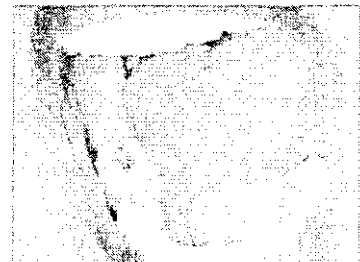
We can safely remove amalgam (silver/mercury) fillings and replace them with more aesthetically pleasing tooth coloured fillings. White fillings will make you feel and look healthier.



AFTER

Click Before & After Buttons

This mercury free dentistry section outlines the dangers posed by silver fillings: concentrated electric fields; hypersensitivity; and toxicity.



A disturbance in the field

Teeth can work like batteries. Metal in the mouth produces electrical fields around certain teeth which can produce many bizarre effects. American holistic dentist Hal Huggins used to show slides of teeth that had been cut open to show the scorch marks they contained where electrical currents had been running for many years.

This effect is hardly surprising when you consider that, with every filling in your mouth, there are two or more metals and a saltwater fluid medium (saliva). This is exactly how Alessandro Volta's original batteries were made, and the battery in your current motor-car is essentially the same thing.

The trouble starts because of the fact that electrical currents leach the mercury out of the teeth through an effect called 'electrolysis', where damage is due to the passage of galvanic (uni-directional) electrical current. This is why some patients complain of a constant metallic taste in the mouth, which is made worse by hot fluids and salty foods (as these create more electrolysis). Most worrying, electrolysis is capable of releasing deadly mercury vapour, which goes straight to the brain tissue, where it is highly invasive and toxic.

Nevertheless, as potentially damaging as mercury in the mouth is the electricity itself. When testing teeth for electrical effects, I have seen momentary sparks of up to one volt - enough to light a small torch or flashlight. It's worth remembering that the currents generated by amalgams are formed very close to the brain, which ordinarily operated at far lower potentials (only a few millivolts). The brain lies only a few millimetres from the jaw bone, where the roots of the teeth are inserted, just on the other side of the thin cranial bone and the meninges (the three membranes enveloping the brain and spinal cord). This kind of current can cause metal dysfunction, which I often find in clinical practice.

One patient of mine, a 44-year old woman with Meniere's disease, also suffered from vertigo and vomiting, with intermittent staggering (so-called sailor's gait). She couldn't think clearly any more and had trouble with her memory and eyesight. These mental problems, plus a constant pain in the nape of the neck, left her unable to work. But as her doctors could find no clinical explanation, she was told it was all in her head - which in a way was true. When a brain tumour was suspected, tests were required to exclude this grim possibility.

Eventually, a surgeon referred her to a Dr Helmut Raue, an electroacupuncture specialist who understands biological dentistry. He measured her teeth for galvanic currents and found a 215 microampere current between a gold filling and a nearby amalgam. A week after she had the amalgam removed, all pain had

disappeared, and her balance had returned to normal.

As patients usually don't consult their dentist when they experience symptoms such as headache, facial neuralgia, dizziness, sleep disorders and digestive disturbances, such cases don't often come to light.

Energetic Fields

Besides simple battery problems, electroacupuncture practitioners are finding teeth as transmitting foci to be a common cause of energetic disturbance. The problem is much more complicated than it might at first seem.

Several key acupuncture meridians cross the line of the teeth as they pass over the face. An abscess or 'transmitting focus' can create pathological effects anywhere along the meridian. As these meridians are connected to secondary organs and other sites, problems with a front incisor may have an impact on the kidneys as the kidney meridian passes through the incisor teeth. The kidneys, in turn, are related to the knee joints. With patients who have incisor problems or a bridge at this location, I always surprise them by asking about the arthritis in their knees, which they invariably have.

The consequences of these interconnections are sometimes very surprising indeed. In one case, a dentist had prepared a crown prosthesis, the type that uses a nickel post that fits in a hole drilled down the centre of the tooth to give it support. As the post was being inserted in the right upper jaw, the patient let out a squeal; she had gone blind in the right eye. When the dentist removed the crown, she could see again. When he then put it back on, she went blind again. This was repeated several times, after which she refused the crown and had the tooth removed.

What is important about this striking example of what we might call 'virtual dentistry' is how instantaneous the reaction was. For this reason, it could not have resulted from a chemical or even metal toxicity. Allergies to nickel are not uncommon but, clearly, it would take time to develop and become manifest. The sudden loss of the patient's vision indicated a clear neurological dysfunction along the optic pathway due to a field disturbance, probably at the quantum level.

This story makes vividly clear what risks we take when we allow metal into our mouths. The resulting disturbance of the body's energy field can have unpredictable and serious consequences. If this woman had not lost her vision immediately, but had gone blind over the subsequent few weeks, it is near-certainty that the correct cause would never have been diagnosed. She would have likely ended up undergoing harmful and unnecessary interventions, all of which would fail because they were not correcting the real problem.

Three types of problem

There are really three issues where mercury is concerned. The first is the tendency of mercury to concentrate electrical fields. This is an ordinary biophysical effect and explains why people with too many dental fillings cannot work in areas where large field currents are developed.

The second is hypersensitivity. This is really more or less an allergic reaction to mercury and various estimates place this applying to between 1 and 15 percent of the population. Anyone in prolonged contact with mercury tends to develop a sensitivity - thus dental students show a sharp increase in the percentage of positive patch tests for mercury sensitivity as they progress through their studies.

In passing, it should be noted that similar sensitivities can occur with other metals, notably nickel, chromium, cobalt and gold, though these are rare.

The third and most important effect has been talked about already; that is, toxicity. We inhale mercury vapour from our amalgam and swallow its compounds. This loss of mercury is increased by chewing hot or salty foods.

Unfortunately, mercury from the teeth has an especially great affinity for brain tissue but it also lodges in other body organs. It can have a disastrous effect on the immune system.

Oral galvanism

Another surprise reason for the release of the metal in its natural state entirely unthought of until the last few years, is electrolysis - that is, the electrical dissolving of metal. Amalgam-filled teeth can actually act as tiny batteries and give off a current. Examination of the inside of such teeth show oxidation (scorch) marks where the current has flowed over many years. So, far from being safe, having dental fillings is rather akin to sucking a mercury lozenge continuously!

The symptoms

The symptoms of mercury toxicity can be many and varied. In fact the range of effects covers all target organs. It seems to contribute to allergy problems, probably by increasing the body load, so any allergy symptoms can

be prolonged or made worse by it. Suppression of the immune system may coincidentally lead to Candida overgrowth and it may be difficult to eradicate this organism without first attending to the possibility of mercury poisoning.

Mercury toxicity should be considered in any allergy case not responding to proper treatment. This is especially important in degenerative and auto-immune diseases such as multiple sclerosis, lupus erythematosus, rheumatoid arthritis, colitis and even, it is said, arteriosclerosis (hardening of the arteries). Also any vague mental symptoms not responding to other treatment, such as lethargy, depression, loss of memory, etc. might well begin to recover after removal of toxic mercury.

Testing and treatment

We have been bedevilled for years by the lack of a good, objective test to show whether or not the patient is reacting to mercury. The only standardised 'scientific' test for mercury allergy is patch testing. This is very unreliable and, although positive results may be helpful, negative ones do not exclude the presence of significant reactions. We are now able, with the use of Live and Dry Blood Microscopy to detect heavy metal toxicity and tailor make an individual elimination programme.

Treating your mind, body & mouth

How we would test for mercury sensitivity:

1. Check all teeth for galvanic currents, noting the most negatively charged teeth. Anything up to about 50mV is 'acceptable', though hardly normal. Over that should give cause for concern.
2. Test for mercury sensitivity. If indicated then it is vital to test for safe replacements. Alternative filling substances are composite, porcelain and gold.
3. Test for heavy metal toxicity with Live and Dry Blood Microscopy.
4. It may be suggested that the patient go on nutritional supplements to leach out mercury and other heavy metals (chelation). The simplest supplement is sodium alginate, found in seaweed - kelp is quite a satisfactory source. Coriander is also efficient. The use of supergreen's may also be recommended.
5. Where the allergist is not the dentist it is necessary to write to the patient's dental practitioner at this point. He or she must be advised of several safety precautions.

Most important: If fillings are to be removed, they must be removed in the right sequence, otherwise the patient could get much worse. It is essential to start with the most negatively- charged tooth and then work gradually towards the positively-charged ones.

The dentist must isolate the teeth and provide efficient air extraction to prevent the patient swallowing mercury vapour. It is also a good idea for the patient to take charcoal tablets before and after amalgam extraction, to absorb any stray mercury.

For more sick patients, it may be a good idea to go on a hypoallergenic diet and take vitamin and mineral supplements through this period, starting a few days before the first visit to the dentist. See pre-treatment instructions below.

Pre-treatment instructions

- Charcoal:
1 tablet on the morning of your treatment and 1 tablet after treatment
- Multi Vitamins:
1 tablet to be taken 3 times a day - the day before, day of and day after treatment.
- Selenium:
1 Tablet to be taken on the day before, day of and day after treatment.
- Homeopathic Amalgam:
Let 2 tablets dissolve under your tongue, the day before, the day of and the day after the treatment.
NOTE - The tablets can be chewed or sucked "on a clean tongue" at least half an hour after food, coffee, and peppermint (including toothpaste or tobacco)
- Vitamin C:

Allow a quarter teaspoon of the powder to dissolve in a small amount of water. Take on the morning of treatment and in the evening after treatment.

- Drink:
Plenty of bottled, still water on the day of treatment.
- Propolis and Supergreens:
May be prescribed at my discretion.

It needs to be understood that the alternative materials cannot be expected to be as durable as the mercury amalgam. Patients are advised to go to a dentist who has had a lot of practice with these alternative types of filling.

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Manchester dentist Dr Phillip Wander is a celebrity dentist to the TV stars and footballers. He provides private cosmetic dental treatments including smile makeovers, dental implants, teeth whitening, veneers, crowns, and mercury free dentistry with white fillings. He is a leading homeopathic dentist with special dietary guidelines. 22 St Ann's Square in Manchester.

Dental Health Care

Dr Philip Wander
BDS MGDS RCS DFHom
Homeopathic Dentist

in Manchester

Tel 0161 834 1643

Dr Philip Wander

celebrity dentist



Manchester dentist Dr Philip Wander is a renowned homeopathic dentist to the celebrities having treated many Manchester United footballers including David Beckham, Ryan Giggs, Eric Cantona and Mark Hughes, as well as other footballers including Paul Ince, Andy Cole, Lee Sharpe, Nikky Butt, Gary Pallister, Andrei Kanchelskis. Other celebrity patients that have attended the St Ann's Square dental practice include Tina Turner, Val McDermid, Bryan Robson, Johnny Vegas, Helen Mirren, Robert Carlyle, Claire Moore (Phantom of the Opera), Pete Wylie (The Mighty Wah!), Sir John Manduelli, The Dakotas, Nick Freeman (Mr Loophole, celebrity lawyer), and TV stars including many actors from Coronation Street.

SUTCLIFFE
DENTAL



As a celebrity dentist, Dr Wander comments regularly in the media about dental topics of interest and you may have seen or heard him on **BBC Greater Manchester Radio** or **ITV Granada**.

For years people have taken care of themselves using techniques and medicines that work with, rather than against, the body. You may not realise that the same natural and minimally invasive care is also available for your teeth and mouth. Dr Philip Wander specialises in dentistry techniques that minimise discomfort, and improve health, not only in your mouth, but in your body as a whole.

As founder and Chair of the British Homeopathic Dental Association he has over 15 years experience of using homeopathy in dentistry, both to prepare patients for treatment and to encourage healing afterwards. He is one of the best known homeopathic dentists in the UK and his work has led him to being awarded an honorary fellowship of the Faculty of Homeopathy.

With over 30 years experience in dentistry he is recognised, both in the UK and internationally as an expert in clinical dental photography - a topic on which he has lectured extensively.

Dr Wander's priority as a dentist is to provide you with the highest quality dental care using materials and methods which optimise your overall health. From the moment you step into our warm and friendly reception area you can be reassured that your physical and mental wellbeing is our first priority. Dr Wander understands that many people are a little apprehensive when visiting the dentist and he will do everything he can to put you at ease.

Whether or not you already have in mind the treatment you would like, we will spend your first appointment discussing your past medical and dental history and reviewing the treatment options available to you. Dr Wander firmly believes that you should take an active and integral role in your dental health.



Dr Wander will provide you with detailed information on the proposed procedures, enabling you to make an educated decision, and will take as much time as you need to answer questions and concerns. Once we have agreed on the most suitable treatment, Dr Wander will often prescribe a homeopathic pre-treatment programme to prepare your body for the procedure, boosting your immune system and encouraging healing. If you are particularly anxious he can also provide you with some remedies to help you relax.

At all times during the treatment, he will keep you informed about the procedures taking place. Our sophisticated cameras allow you to see exactly what he sees in your mouth, and enable you to monitor and understand the bespoke treatment you receive. After each stage of the treatment has been completed you will, if necessary, receive further homeopathic remedies to reduce any discomfort. These remedies are effective and have no side effects.

If your health is such that you would benefit from further investigations, Dr Wander can refer you to recommended naturopaths, nutritionists and herbalists and organise testing for food tolerances and mineral deficiencies. If you have any questions about the treatments available, don't hesitate to speak to our receptionists who will be pleased to help.

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Manchester dentist Dr Philip Wander is a celebrity dentist to the UK stars and footballers. He provides private cosmetic dental treatments including smile makeovers, dental implants, teeth whitening, veneers, crowns, and mercury free dentistry with white fillings. He is a leading homeopathic dentist with special dietary guidelines. 20 St Ann's Square in Manchester.



BDA Manchester

BDA North West
Region

Manchester Office

Applies to: All

Last reviewed: 03/09/2010 Last updated: 26/06/2008

Print page

PDF this page



BDA Manchester
Lowry House
17 Marble Street
Manchester
M2 3AW
Tel: See individual contacts below
Fax: 0161 638 8673

The BDA Manchester office opened in May 2008. By developing a more regionalised approach, the BDA aims to be more responsive to its members. Opening the Manchester office is an important step towards achieving this goal. There are currently five members of BDA staff based in Manchester, and we will be developing the office and adding more staff as time goes on.

The BDA Manchester office is in central Manchester, about 15-20 minutes' walk away from Piccadilly railway station. The tram service is excellent, with the nearest stops being Market St (2 mins walk), Piccadilly Gardens (5 mins walk) and Mosley Street (3 mins walk, southbound only).

BDA staff based at the Manchester office

Joanne Whistler
NW Regional Consultant



The NW Regional Consultant promotes the interests of BDA members in the NW of England, and aims to make the BDA more responsive to the needs of its members in the region.

NB The Regional Consultant role requires a great deal of time away from the office, so to ensure post reaches Joanne quickly, please use the following address.

PO Box 488,
Keighley
BD21 9AA
Tel: 07515 199 937
Email: j.whistler@bda.org

Laura Thompson
Student Marketing Executive



The Student Marketing Executive promotes the BDA to dental undergraduates in the UK, provides their main point of contact with the BDA, and develops products and services to meet their needs.

NB The Student Marketing Executive role requires a great deal of time away from the office, so to ensure post reaches Laura quickly, please use the following address:

British Dental Association,
64 Wimpole Street,
London
W1G 8YS
Tel: 07725 498 822
Email: l.thompson@bda.org

Paula Slinger
Business Advisor

Tel: 020 7535 5864

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The Business Advisor is responsible for researching, monitoring, analysing and advising members on the business aspects of running a dental practice; incorporating, NHS dentistry, finance and tax, business structures, property and planning matters, private practice conversion, setting up in practice, buying and selling a practice, business planning and business strategy and marketing.

Melanie Hockenhull
Practice Management Consultant

Shabana Ishaq
Practice Management Consultant

Tel: 020 7563 4574

Email: m.hockenhull@bda.org

Tel: 020 7563 4574

Email: s.ishaq@bda.org

The Practice Management Consultant is responsible for providing advice to members on issues encountered in the course of running a dental practice. This guidance focuses primarily on employment and commercial matters, ranging from dismissals to the recovery of debts. The Practice Management Consultant also researches, updates and informs members of recent changes to the law affecting the running of a dental practice.

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American Medical News

BUSINESS

AT&T forms health IT division

AT&T ForHealth will focus on developing and delivering telehealth, cloud computing and wireless monitoring devices.

By PAMELA LEWIS DOLAN, amednews staff. Posted Nov. 24, 2010.

AT&T announced that it has formed a division geared toward health information technology, a market it estimates to be worth nearly \$34 billion.

The new division, AT&T ForHealth, will focus on the development and delivery of health IT solutions, including telehealth, cloud computing and wireless monitoring devices.

The company said it generated about \$4 billion in revenue from its health care industry businesses in 2009. The company wants to tap further into a market that is predicted to grow 24% during the next four years from its current \$33.9 billion.

"We believe the health care industry is at a tipping point for fundamental change that will improve patients' care and lead to better health care outcomes," said John Stankey, president and CEO of AT&T Business Solutions. "Networking solutions using cloud-based mobility and telepresence technologies can help the overall industry deliver better care to people while driving costs out of the system."

The New England Healthcare Institute, an independent research firm in Cambridge, Mass., released a study in January 2009 estimating that home monitoring and mobile disease management technology could save the health care industry \$4.7 billion to \$6.4 billion a year.

Mike Sapien, principal analyst with Ovum, a market research firm in London, said there has been talk of mobile health applications for several years. Only recently have the devices become affordable and easy for consumers to use, he said. But challenges to widespread adoption remain.

Persuading physicians to use, and getting payers to pay for, some of the solutions AT&T is touting will be difficult. But the company has the "ability to make it stick this time," partly because the company is promoting the products and services for use among its employees and is forming key partnerships with others in the mobile health care and telehealth industry, Sapien said.

In October, AT&T announced a partnership with WellDoc to deploy its mobile diabetes management solution, which it plans to deploy internally to a select number of AT&T employees.

In March AT&T announced it will provide wireless connectivity for Vitality

GlowCaps, a system that sends verbal and visual reminders for patients to take their medications.

Sapien said the partnerships are important, as is the fact that AT&T knows they need them to be successful.

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BUSINESS

U.S. plans to create massive medical claims database

Advocates for health privacy raise preliminary concerns and call on the Office of Personnel Management to postpone its launch.

By EMILY BERRY, amednews staff. Posted Nov. 8, 2010.

The Office of Personnel Management, which manages benefits for federal employees, intends to create a giant database of medical claims information about those employees and enrollees in two programs created by the Patient Protection and Affordable Care Act.

In an Oct. 27 letter, the Center for Democracy & Technology, a nonpartisan Washington, D.C.-based group that advocates for health privacy, asked the OPM for more information about its intentions, raised preliminary concerns about the idea and asked the office to delay its launch from Nov. 15.

"The HHS secretary has noted on numerous occasions that privacy and confidentiality ... [are] foundational to the health care system itself," said Harley Geiger, policy counsel for the center.

The letter was co-signed by several organizations, including the American Civil Liberties Union, the American Federation of Government Employees, the AFL-CIO, the Consumers Union and the National Partnership for Women & Families.

"The research it describes in the notice is very open-ended," Geiger said. "Most people believe or should reasonably expect their plans to have their medical claims data and health information, but they do not expect that the government is collecting copies of this information into one large database for purpose of conducting research on it or disclosing it to law enforcement."

In response to the letter, the OPM told the group that it would release a revised notice, ostensibly with more details, as requested.

The agency did not state whether it believed the privacy complaints had merit.

Launch announced

According to its original notice, published Oct. 5 in the *Federal Register*, the office wants to gather the claims data from the Federal Employee Health Benefit Program; the National Pre-Existing Condition Insurance Program, which launched in August; and the Multi-State Option Plan, which will start in January 2014.

The latter two programs were created under the Patient Protection and Affordable Care Act.

The database would include claims data on millions of people.

The Federal Employee Health Benefit Program has about 8 million enrollees.

The Pre-Existing Condition Insurance Plan, which helps individuals who cannot find coverage in the commercial market because of their health conditions, opened enrollment in July. The program is run by the Dept. of Health and Human Services in 21 states and agencies in 29 states and Washington, D.C.

Anticipated enrollment estimates range from 200,000 to 375,000, according to the Kaiser Family Foundation.

The Multi-State Option Plan is an insurance program scheduled for 2014 that will be available to people in every state and administered by the OPM.

According to the *Federal Register* notice, the Office of Personnel Management wants to use the proposed database to "actively manage the programs to ensure the best value for both enrollees and taxpayers."

The OPM listed reasons it might share the data, including for law enforcement, court proceedings and congressional hearings.

The OPM could do a lot with the data, including calculating the costs of various health conditions and conducting predictive modeling -- examining claims to find patterns to help predict and prevent serious and costly illnesses, said Jeffrey Gasser, a health data analytics expert and executive vice president of Deerwalk, a data management firm in Lexington, Mass.

"The Holy Grail of predictive modeling is to find people who don't cost a lot of money today, but might cost a lot tomorrow," he said.

Large- and medium-sized employers have been gathering databases the same way for many years, Gasser said.

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BUSINESS



[Illustration by Chris Gash / www.chrsgash.com]

Electronic medical records: What your data can tell you

Data analysis will help your practice achieve meaningful use, qualify as part of an accountable care organization, and identify at-risk patients or inefficient business practices.

By PAMELA LEWIS DOLAN, amednews staff. Posted May 2, 2011.

One of the perceived advantages of electronic medical records is that physicians will have a wealth of information that can help them gain greater insight about patients.

The process of gathering and examining this information is called data analytics. For practices that are applying for federal bonuses for meaningful use of technology, or planning to work with accountable care organizations, analytics will be critical for proving that a practice is doing well enough to earn a bonus.

But even a practice that isn't participating in these programs can use analytics to get a solid, fact-based snapshot of how it is performing. Analytics can show physicians how similar chronic-care patients are faring, or show common threads among patients, or even help a practice identify expansion opportunities. And with more health plans offering performance-based pay, being able to collect data can help a practice prove its case for a better bonus.

"Apart from the moral and ethical imperative to do what is the best and the safest and the most effective treatments for patients ... physicians are also businessmen," said Ahmed F. Ghouri, MD, co-founder and chief medical officer of Anvita Health, a health care analytics firm based in San Diego. Clients include health plans, pharmacy benefit managers, disease management companies and physicians. "They're going to need analytics to be more successful, because they're going to need tools to keep patients from coming back to the hospital and to keep them healthy. They'll make more money by doing that," Dr. Ghouri said

A practice could pore through paper charts, but you need an EMR system to provide ways to search and organize patient data. The easier it is to collect and analyze data, the easier to use that data, whether by reaching out to at-risk patients or instituting changes to make a practice more efficient and financially sound.

The ultimate goal: seeing the forest of your patient population through the trees of your individual appointments.

Getting started: What to find

Before running a search, experts say physicians must ask themselves: What do I want to know?

The first part of analytics is collecting the data. And what a practice collects could be dictated by outside forces.

Under meaningful use rules, physicians must collect data such as patients' smoking status, health problems, medications, symptom surveillance and immunization. Some data collection is optional, at least for stage 1 of meaningful use. Physicians can earn bonuses of up to \$44,000 from the Medicare program, or up to \$63,750 from Medicaid for installing and using a certified EMR system.

The Office of the National Coordinator, the Centers for Medicare & Medicaid Services division overseeing the meaningful use program, has made it clear that the data that are optional for stage 1 will be required for stage 2 and beyond, although the second-stage requirements are not yet set.

In addition, in proposed regulations for CMS' Medicare Shared Savings Program for Accountable Care Organizations, health care organizations that align themselves as part of an ACO will be required to collect certain data. ACOs also are expected to have close ties with meaningful use criteria. Proposed ACO rules require that at least 50% of primary care physicians in the ACO be meaningful EMR users.

With the data in hand, physicians might be required by their ACO, for instance, to run reports on their diabetic patients to track their health and their health costs.

But physicians don't need prodding from an ACO to collect and run data.

Marc Holland, vice president of market research at HIMSS Analytics, said most practice management systems and EMRs, especially those certified to meet stage 1 meaningful use, allow for rudimentary analyses of data, such as creating reports of all the patients with a particular condition, or patients within a particular demographic.

Depending on the type of EMR a practice is using, it automatically might generate predefined reports that can be accessed by clicking on a file within the EMR.

Most EMRs also will have a function that allows a query or data sorting to display information for analysis. Examples include a list of all diabetic patients or a list of all patients within a certain age range.

Data analytics would be used to identify at-risk patients to assess their needs and identify if those needs are being met, experts said. For example, Prevea Health, a health care system in Green Bay, Wis., conducted a study to measure the effectiveness of analyzing patient data to identify possible at-risk diabetic and hypertensive patients and to reach out to them.

"Having the ability to run reports that sit on someone's desk does no one any good," said Ashok Rai, MD, CEO of Prevea Health of Green Bay, Wis. Organizations must be able to take action on that data, he said. And the more immediate that action, the better the results.

Next step: what to do with the data

Prevea used analytics to identify diabetic patients who had not had a hemoglobin A1c test in at least six months and hypertensive patients who had not had a systolic blood pressure reading in the same time frame. The system identified the patients, then flagged the ones who were considered noncompliant. Once those patients were identified, an automated phone call asked them to come in for a checkup.

The organization found in a later analysis that those patients who received the calls were about twice as likely as those who did not receive them to come in for a wellness visit and undergo the necessary tests. Results of the study were published December 2010 in the *Journal of Population Health Management*.

Holland used the example of a Washington, D.C, hospital at which an emergency physician noticed a spike in patients with gastric problems over 24 hours. Using data from the hospital -- as well as data from hospitals and physician practices that belonged to the same affiliated health information exchange network -- the doctor was able to query the number of patients from across that network who presented with similar gastric problems.

Using that data, investigators were able to identify a food poisoning outbreak and even identified a convenience store and a spoiled batch of deli meat as the source.

Similar analysis could identify areas for practice expansion or research, experts say. For instance, physicians could query the number of overweight patients in a community for purposes of launching support groups or creating nutritional counseling services.

"The ability to have a software agent in the background monitoring this kind of data and looking for patterns, and the ability to highlight to a human being what the software senses to be an unusual pattern, has tremendous value," Holland said.

The future: the evolution of analytics

Some additional analytic tools physician practices may want to adopt can be built for a

few hundred dollars depending on the depth and complexity the practice wants, Holland said. Tools also may depend on whether the practice plans to use only its own data or pull from other sources, such as other health information exchange participants, and how outside data are made available.

Data analytics can be used by small practices, but experts said it works even better if those practices have access to information beyond their walls, such as the example Holland gave about how a large network was used to identify a food poisoning outbreak. That way, physicians have a larger sample size to examine if necessary.

As more health care organizations adopt EMRs, and more health information exchanges are formed, Holland said, there will be a much wider set of data to analyze and more ways for health care organizations to use those data.

Health care organizations should start planning for future analytics so the technical and logistical groundwork can be laid, said Dr. Ghouri from Anvita Health. He said it's not practical for an organization to decide on doing this type of activity then go live with it in 30 days.

Regardless of whether a practice plans to participate in the meaningful use or ACO incentive plans, experts said, the government has made clear that physicians eventually will need analytics to increase revenue and improve quality.

HIMSS Analytics Vice President of Market Research Marc Holland died on April 16 after a brief illness, as this story was prepared for publication.

ADDITIONAL INFORMATION:

Data requirements

Stage 1 of meaningful use can serve as a great starting point for practices that want to start experimenting with data analytics, experts say. There are requirements that involve collecting certain data and running reports on those data.

Core requirements involving data

- Collect patient demographics (sex, race, ethnicity, date of birth, preferred language, and in case of hospice care, preliminary cause of death).
- Collect vital signs, and chart changes in height, weight, blood pressure, BMI and growth charts for children.
- Maintain problem list and current diagnosis.
- Maintain active medication list.
- Record smoking status of patients age 13 and older.
- Report clinical quality measures to the Centers for Medicare & Medicaid Services or state agencies.

Menu objectives involving data collection

- Generate lists of patients by specific conditions.
- Submit immunization data to registries or immunization information systems.

- Submit electronic syndromic surveillance data to public health agencies.

Source: Centers for Medicare & Medicaid Services

The more codes there are, the more data to analyze

Much of the data analytics dealing with patient outcomes rely on the use of diagnostic and procedure coding data, specifically ICD-9 codes.

But by October 2013, the International Classification of Diseases code set will be ICD-10. It will result in a marked increase of codes used to identify procedures and diagnoses -- from 17,000 under ICD-9 to 155,000 under ICD-10.

The change is so great that the American Medical Association and others pushed for a delay from the original 2011 deadline for implementing ICD-10, which President George W. Bush granted in January 2009.

However, a report by HIMSS Analytics notes that the increase in codes will allow for a more specific look at patient conditions and treatments -- and allow for a richer, more detailed set of data for physicians to use.

"The increased granularity, combined with the increased electronic capture of clinical data, will yield volumes of new data for which health care organizations will have the opportunity to translate into information that can be used to improve the delivery of health care in the United States," wrote the authors of the HIMSS Analytics study.

But, the authors warned, health care organizations will need the proper tools to store, review and analyze the data for efficient analyses.

The first step for physicians is making sure their electronic medical record vendor has solid plans to convert their systems to utilize the ICD-10 codes. The codes must be entered and stored by an EMR system before they can be extracted for any type of data analysis.

WEBLINK

"Using Physician-Led Automated Communications to Improve Patient Health,"
Population Health Management, December 2010
(www.ncbi.nlm.nih.gov/pubmed/21192767)

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» HHS site invites public to compare mortality rates at 4,700 hospitals Sept. 22/29,
2008

Exhibit C

1. FCC Order (Citing)

Bluechiip Ltd. Tracking Solutions Request for Waiver of Section 15.205(a) of the Commission's Rules.

2. TV White Spaces Databases and Database Administrators (Citing)

3. Alaska Science Forum (Citing)

Powerful Radio Signals add ree Soundtrack Article #1221

4. Amateur License – AB7VP – Hunsucker, Robert D. (Citing)

5. Alaska Science Forum (Citing)

Radiowave Effects on Humans Article #386

Federal Communications Commission

DA 11-461

Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of)
)
Bluechiip Ltd. Tracking Solutions Request for)
Waiver of Section 15.205(a) of the Commission's)
Rules)

ORDER

Adopted: March 9, 2011

Released: March 9, 2011

By the Chief, Office of Engineering and Technology:

I. INTRODUCTION

1. By this action, we grant a waiver of restricted band prohibitions contained in Section 15.205(a) of the Commission's rules to bluechiip Ltd. Tracking Solutions ("bluechiip") to allow operation of an inductive tracking device in the 1.5-4.2 MHz band.¹ We find that granting this waiver is in the public interest in that it will permit the use of radio frequency (RF) devices which can offer improvements in tracking of genetic, stem cell and other biological materials stored under extreme temperature conditions without resulting in harmful interference to authorized users in the 1.5-4.2 MHz band.

II. BACKGROUND

2. Part 15 of the Commission's rules permits the operation of low power radio frequency devices without an individual license from the Commission. The technical requirements contained in Part 15 are designed to ensure that there is a low probability that non-licensed devices will cause harmful interference to authorized users of the radio spectrum. The Part 15 requirements cover two general classes of devices: 1) unintentional radiators, such as computers and radio receivers, that intentionally generate but do not intentionally emit radiofrequency energy, and 2) intentional radiators, such as wireless networking equipment, cordless telephones and garage door openers, that intentionally generate and emit radio frequency energy, either by radiation or induction.² Operation of intentional radiators is permitted either under the low levels specified in Section 15.209 or at higher levels in specific frequency bands under other provisions in Part 15.³

3. Some frequency bands are designated as restricted to protect certain radio services from interference, such as those services that involve protection of safety-of-life or that are dependent on very low received signal levels, such as satellite downlinks or radio astronomy. These "restricted bands" are specified in Section 15.205.⁴ Only spurious emissions are permitted from intentional radiators in the restricted bands.⁵ The limits for spurious emissions in the restricted bands are the same as the radiated

¹ Bluechiip Ltd. Tracking Solutions, Request for Waiver of Section 15.205(a) of the Commission's Rules, filed November 12, 2010.

² See 47 C.F.R. §§ 15.3(z) and 15.3(o).

³ See 47 C.F.R. § 15.209.

⁴ See 47 C.F.R. § 15.205.

⁵ See 47 C.F.R. § 2.1. Spurious emissions are defined as, "Emissions on a frequency or frequencies which are outside the necessary bandwidth and the level of which may be reduced without affecting the corresponding transmission of information. Spurious emissions include harmonic emissions, parasitic emissions, intermodulation (continued....)"

mission limits in Section 15.209.

4. Bluechiip manufactures an inductive tracking system that is designed for tracking and retrieving genetic, stem cell and biological materials stored at extremely cold temperatures in “biobanks.” The bluechiip system consists of two components: an RF interrogator and non-electronic micro-electro-mechanical system (MEMS) tags that are capable of being molded into storage containers. Each tag contains a physical structure of 46 micro-beams in which each micro-beam is designed to resonate (vibrate) at a specific RF frequency when excited by a magnetic field generated by the interrogator. The interrogator detects the presence or absence of particular resonant frequencies from the micro-beam structure to identify a particular tag. The interrogator steps through 80 sub-bands of approximately 30 kilohertz each over the 1.5-4.2 MHz band. Each read pulse is 40-60 microseconds, and the total time required to read a tag is 200-400 milliseconds.

5. There are three restricted bands within the 1.5-4.2 MHz band: 2.1735-2.1905 MHz, 4.125-4.128 MHz, and 4.17725-4.17775 MHz.⁶ Bluechiip requests a waiver of Section 15.205(a) to allow its tracking system to transmit in these restricted bands. In support of its waiver, bluechiip argues that its system requires the use of the 1.5-4.2 MHz band to perform reliably. It states that it investigated other frequency bands that are not restricted, but found that higher frequencies suffer from a lower signal-to-noise ratio, making tags difficult to read or prone to errors. Bluechiip also states that the manufacturing of MEMS chips that operate at higher frequencies is less reliable because the smaller micro-beams required at higher frequencies have greater variability in their resonant frequencies due to manufacturing tolerances. It further states that tags operating at frequencies below 1.5-4.2 MHz must be made larger to include more coils for inductive signaling, which affects container molding and increases chip impedance that, in turn, lowers the signal-to-noise ratio and reliability of reading the tag. It claims that the features which make this technology well suited for biobank applications—small tag size, reliability and low cost—dictate where in the spectrum the system must operate.

6. Bluechiip states that it is unclear whether the Commission’s rule limiting emissions in the restricted bands to spurious emissions applies to induction devices, *e.g.*, devices that generate a magnetic field. It contends that radio receivers in the restricted bands are sensitive only to electric field emissions and not magnetic field emissions like those produced by its device. Bluechiip argues that all transmitted information from an induction device is in the magnetic field and none is in the electric field, so that all emissions that a receiver in a restricted band is capable of receiving could be reduced without affecting the transmission of information, and could therefore be considered to be spurious emissions as defined by our rules.

7. Nonetheless, bluechiip argues that, to the extent a waiver is necessary, its system will not adversely impact or be impacted by operations in the restricted bands, and therefore the Commission’s policy goals underlying Section 15.205(a) will not be undermined. It states that its device is intended to transmit over a distance of millimeters and produces low emission levels. Bluechiip represents that all emissions in the restricted bands are below the Section 15.209 limits. It also claims that its system is immune to interference from high level radiated and magnetic fields in the 1.5-4.2 MHz bands.

8. Finally, bluechiip argues that grant of the requested waiver would be in the public interest. It (Continued from previous page)

products and frequency conversion products, but exclude out-of-band emissions.” Necessary bandwidth is defined as, “...the width of the frequency band which is just sufficient to ensure the transmission of information at the rate and with the quality required under specified conditions.”

⁶ The 2.1735-2.1905 MHz band is used by the Federal Emergency Management Agency for high power emergency response; the 4.125-4.128 MHz band is used by the Global Maritime Distress Safety System for search and rescue activities; and the 4.17725-4.17775 MHz band is used for maritime search and rescue. In particular, the frequencies 2.182 MHz and 4.125 MHz are distress frequencies.

states that biobanks are a vital part of health care and biomedical research and that tracking of biological materials stored in biobanks will be more of a necessity as new uses are discovered and demand continues to skyrocket. It claims that recent studies indicate that hundreds of millions of samples are stored in U.S. biobanks and more than one billion are stored worldwide. Bluechiip argues that there are difficulties with present methods of tracking samples in biobanks, which store biologic material in liquid nitrogen at temperatures as low as -196 degrees Celsius. It states that barcodes are often obscured by frost and that barcode labels tend to lose adhesion at extremely cold temperatures. It further states that radio frequency identification (RFID) systems may be able to read through frost, but they cease functioning at extremely cold temperatures and the RFID tags cannot tolerate the gamma radiation used to sterilize containers. Bluechiip states that its technology produces a virtually indestructible "license plate" which has been field proven to survive autoclaving and gamma radiation sterilization, humidification, centrifugation and cryogenic storage.

III. DISCUSSION

9. We are authorized to grant a waiver under Section 1.3 of the Commission's rules if the petitioner demonstrates good cause for such action.⁷ Good cause, in turn, may be found and a waiver granted "where particular facts would make strict compliance inconsistent with the public interest."⁸ To make this public interest determination, the waiver cannot undermine the purposes of the rule, and there must be a stronger public interest benefit in granting the waiver than in applying the rule.⁹ The prohibition on operation in the restricted bands listed Section 15.205(a) exists to ensure that Part 15 intentional radiators do not harmfully interfere with authorized radio services, including Federal Government services. As discussed below, a waiver of the frequency band restriction in Section 15.205(a) for operations as described by bluechiip can be granted without increasing the potential for harmful interference. Hence, granting this waiver will not undermine the purpose of the rules. Finally, there is a strong public interest benefit in granting this waiver because to do otherwise would prevent the availability of systems that would enable tracking of biological materials stored under extreme conditions that is important to the public well-being. Accordingly, we find good cause exists for granting a waiver of Section 15.205(a) for the bluechiip devices.

10. As an initial matter, we disagree with bluechiip's suggestion that Section 15.205(a), which limits emissions in the restricted bands to spurious emissions, may not be applicable to induction devices. Spurious emissions are by definition emissions that are outside the necessary transmit bandwidth of a device, whereas the emissions from the bluechiip system that fall within restricted bands are fundamental emissions.¹⁰ The fact that the bluechiip system produces primarily magnetic emissions is not relevant to this determination, as the definition of spurious emissions does not distinguish between electric field and

⁷ 47 C.F.R. § 1.3. See also *ICO Global Communications (Holdings) Limited v. FCC*, 428 F.3d 264 (D.C. Cir. 2005); *Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164 (D.C. Cir. 1990); *WAIT Radio v. FCC*, 418 F.2d 1153 (D.C. Cir. 1969).

⁸ *Northeast Cellular*, 897 F.2d at 1166; see also *ICO Global Communications*, 428 F.3d at 269 (quoting *Northeast Cellular*); *WAIT Radio*, 418 F.2d at 1157-59.

⁹ See, e.g., *WAIT Radio*, 418 F.2d at 1157 (stating that even though the overall objectives of a general rule have been adjudged to be in the public interest, it is possible that application of the rule to a specific case may not serve the public interest if an applicant's proposal does not undermine the public interest policy served by the rule); *Northeast Cellular*, 897 F.2d at 1166 (stating that in granting a waiver, an agency must explain why deviation from the general rule better serves the public interest than would strict adherence to the rule).

¹⁰ See *supra* note 5.

Federal Communications Commission

DA 11-461

magnetic field emissions. Thus, we find that a waiver of Section 15.205(a) is necessary for this device to operate in the 1.5-2.4 MHz band.

11. We believe that, based upon bluechiip's representations, grant of the requested waiver is in the public interest. As bluechiip describes, biobanks are a vital part of health care and biomedical research, and there are large number of biological samples stored in biobanks in the U.S. and worldwide. Existing tracking technologies such as RFID and optical barcodes may not function properly under the extremely low temperatures in biobanks or may not survive the high temperatures and/or radiation used to sterilize containers. Bluechiip indicates that its system can function under the low temperature conditions in biobanks and that its tags can survive the conditions used to sterilize equipment. Grant of the requested waiver will permit the introduction of these new tracking technologies that have benefits for the public, whereas application of the existing rule would deny these public benefits.

12. We also find that grant of the requested waiver will not cause harm to Federal Government systems or other operations in the 2.1735-2.1905 MHz, 4.125-4.128 MHz, and 4.17725-4.17775 MHz bands. As bluechiip describes, the device operates over extremely short distances; on the order of millimeters. Bluechiip represents that the device is capable of complying with the Section 15.209 radiated emission limits, and it is required to submit test data taken in accordance with the applicable measurement procedures to demonstrate compliance with these limits to obtain certification for the device.¹¹ Also, the device will be operated only indoors in biobank facilities where the walls will attenuate radiated emissions.¹² Additionally, the device does not transmit continuously, but rather steps through 80 frequencies and transmits on each particular frequency for only 40-60 microseconds during the 200-400 milliseconds required to read a tag, which corresponds to a transmit duty cycle of much less than 1%. Thus, the potential for the bluechiip system to cause interference to authorized services in the restricted bands is extremely low. Further, operation of this device will be subject to the Part 15 requirements that it may not cause harmful interference to authorized services and that it must cease operation in the event interference occurs.¹³ Therefore, grant of a waiver of Section 15.205(a) will not undermine the purpose of this rule.

IV. ORDERING CLAUSE

13. Accordingly, pursuant to authority in Section 0.31, 0.241 and 1.3 of the Commission's rules, 47 C.F.R. sections 0.31, 0.241 and 1.3, and Sections 4(i), 302, 303(e), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 302, 303(e), and 303(r), IT IS ORDERED that the request for waiver of Section 15.205(a) filed by bluechiip Ltd. Tracking Solutions IS GRANTED. This action is effective upon release of this Order.

FEDERAL COMMUNICATIONS COMMISSION

Julius P. Knapp
Chief, Office of Engineering and Technology

¹¹ See Request for Waiver at 9, Attachment A at 10-11 and Attachment B at 6.

¹² See Request for Waiver at 9.

¹³ See 47 C.F.R. § 15.5.

TV White Spaces Databases and Database Administrators

I. Overview

The Commission's rules provide for operation of low power unlicensed wireless devices in the broadcast television spectrum (TV bands) at locations where that spectrum is unused by licensed services.¹ This unused TV spectrum is commonly referred to as television "white spaces" (TV white spaces). The unlicensed devices that operate in this spectrum (TV band devices) generally provide communications of broadband data and other services for consumers and businesses.

To identify unused spectrum, *i.e.*, vacant channels, TV bands devices must include a geo-location capability and the capability to access through the Internet a database that identifies incumbent licensed operations entitled to interference protection. The protected incumbent operations, include for example, full power and low power TV stations, broadcast auxiliary point-to-point facilities, low power auxiliary service operations (wireless microphones), PLMRS/CMRS operations on channels 14-20, and the Offshore Radiotelephone Service.² The database also includes records reflecting the protected locations and channels of certain radiofrequency services that are not recorded in Commission databases.³ The database accessed by the device will respond with a list of the TV channels that are vacant and can be used at the device's location.⁴ The rules state that the Commission will designate one or more entities to administer the TV bands database function for a term of 5 years.⁵ The Commission has delegated authority for oversight and management of the database administrator(s) and their functions to its Office of Engineering and Technology (OET)⁶

This website provides information regarding TV white databases, their designated administrators and the Commission's requirements for their approval and performance.

II. Selection of the Database Administrators

On January 26, 2011, the OET issued an *Order* designating nine entities to serve as TV white spaces database administrators. Based on the information filed by the conditionally designated administrators, OET found that each of the applicants had shown that they have the technical

¹ See *Second Report and Order and Memorandum Opinion and Order (Second Report and Order)* in ET Docket No. 04-186, 23 FCC Rcd 16807 (2008) and *Second Memorandum Opinion and Order (Second Memorandum Opinion and Order)* in ET Docket No. 04-186, FCC 10-174, adopted September 23, 2010. The rules for unlicensed devices that operate in the TV bands are set forth in Sections 15.701-.717 of the Commission's rules, 47 C.F.R. §§ 15.701-.707. These rules also contain provisions for devices that rely on spectrum sensing to determine available channels.

² See 47 C.F.R. § 15.711. See 47 C.F.R. § 15.717.

³ *Id.* (e.g., the locations of 1) cable headends and low power TV receive sites that are outside the protected contours of the TV stations whose signals they receive; 2) authorized wireless microphones and other low power auxiliary devices are used on a regular or scheduled basis; and radioastronomy sites).

⁴ See 47 C.F.R. § 15.713(a)-(b).

⁵ See 47 C.F.R. § 15.715.

⁶ See *Second Memorandum Opinion and Order* at ¶107.

expertise to develop and operate a TV bands database. However, OET indicated that these designations would be subject to the entities fulfillment of and compliance with certain conditions intended to ensure their adherence to recent changes in the rules and to provide for strong oversight of their system designs and operations by the Commission.⁷ These conditions are:

1. Each of the designated database administrators must supplement its previous filings with sufficient detailed information to indicate how it will comply with the rule changes adopted in the *Second MO&O*. Amendments to proposals must be received by February 28, 2011. Any of the database administrators that filed separate proposals and now wish to consolidate their operations must submit an updated proposal by this same date. Any database administrators that wish to withdraw their proposals must notify the Commission by this same date.
2. All database administrators must attend workshops to be conducted by OET to address the operation of the databases to ensure consistency and compliance with the rules and the database trials, as described herein. Each administrator shall designate a responsible party who will represent its organization at the workshops and also ensure compliance with all of the conditions herein by February 28, 2011. The first workshop is scheduled for March 10, 2011 at the Commission's Laboratory in Columbia, Maryland.
3. Each database administrator must cooperate with any steps OET deems necessary to ensure compliance with the rules, including for example security features.
4. Database administrators must agree that they will not use their capacity as a database manager to engage in any discriminatory or anti-competitive practices or any practices that may compromise the privacy of users.

Database administrators that successfully satisfy all of the conditions herein will be allowed to make their databases available for actual use for the five year term specified in our rules.⁸ OET will announce the public availability of each database, at which time the five year term for that database will commence.

III. The Database Administrators

The designated TV white space database administrators and their status with respect to the required submissions under conditions 1 and 2 above are:⁹

- Comsearch
Contact information: H. Mark Gibson, 19700 Janelia Farm Boulevard, Ashburn, VA
20147
Approval status: Pending

⁷ See Order by the Chief, Office of Engineering and Technology, adopted and released January 26, 2011, DA 11-131.

⁸ See 47 C.F.R. §15.715(h) as revised by the *Second MO&O*.

⁹ These nine entities submitted proposals in response to a Public Notice that the Commission's Office of Engineering and Technology released on November 25, 2009. See "Office of Engineering and Technology Invites Proposals from Entities Seeking to be Designated TV Band Device Database Managers," Public Notice, DA 09-2479, ET Docket No. 04-186, rel. Nov. 25, 2009. The information requested in the Public Notice was based on rules for TV bands databases adopted in the *Second Report and Order and Memorandum Opinion and Order*.

- Frequency Finder, Inc.
Contact information: Peter Moncure, 8910 Dick's Hill Parkway, Toccoa, GA 30557
pmoncure@radiosoft.com
Approval status: Pending
- Google Inc.
Contact information: Alan.Norman, 1600 Amphitheatre Parkway, Mountain View, CA 94043
alannorman@google.com
Approval status: Pending
- KB Enterprises LLC and US Telcom
Contact information: Dr. Georg Schöne, Im Gewerbegebiet 31-33, D-77839 Lichtenau, Deutschland
GSchoene@LStelcom.com
Approval status: Pending
- Key Bridge Global LLC
Contact information: Jesse Caulfield, 1600 Tysons Blvd., Suite 450, McLean, VA 22102
jesse.caulfield@keybridgeglobal.com
Approval status: Pending
- NeuStar, Inc.
Contact information: Brian Rosen, 1775 Pennsylvania Ave., NW, Washington, DC 20006
brian.rosen@neustar.biz
Approval status: Pending
- Spectrum Bridge, Inc.
Contact information: Neeraj Srivastava, 1064 Greenwood Blvd, Lake Mary, FL 32746
n.srivastava@spectrumbridge.com
Approval status: Pending
- Telcordia Technologies, Inc.
Contact information: John P. Malyar, 1 Telcordia Dr., Piscataway, NJ 08854
jmalvar@telcordia.com
Approval status: Pending
- Airity, Inc. (formerly WSdb LLC)
Contact information: Adam Drobot, 2M Companies, 3401 Armstrong Ave., Dallas, TX 75205-3545
Adam.Drobot@2M.com
Approval status: Pending

IV. Database Workshops and Dissemination of Information

As indicated above, all database administrators are required to attend workshops conducted by OET. At these workshops, OET will instruct the database administrators on how to comply with the database rules, identify tasks that must be completed by each administrator, and establish milestone dates for reporting progress on or completion of the identified tasks. Each database administrator is to designate a responsible party from its organization who will attend the

workshops and ensure that the organization complies with all of the conditions below; responsible parties may also have an additional person from their organizations attend each workshop.¹⁰

The workshops will be conducted at the FCC Laboratory in Columbia, MD by staff of OET's Laboratory Division. OET will address implementation details and collect information from the database administrators in these workshops; it will also provide guidance on the requirements to the database administrators on an as needed basis. The database administrators may also decide on their own to meet separately to discuss the various tasks and may include other interested parties in their meetings; however, OET will make final decisions on implementation issues affecting the databases and their operation and all decisions will be publicly available. OET will establish a webpage to post information about, and may seek comment on, the guidance that it will provide to the administrators. Each database administrator must cooperate with any steps OET deems necessary to ensure that the TV bands databases provide accurate and consistent lists of protected services and available channels. Further, they must support capabilities that OET deems necessary to ensure that any changes in registration of protected facilities in one database are rapidly reflected in all others. The workshops are intended to serve as a valuable tool for ensuring that each administrator understands the rules and effectively implements them. Additional guidelines and information will also be published as OET's Knowledge Database (KDB) at www.fcc.gov/labhelp.

V. Database Trial Periods

Each database will be subject to a trial period of not less than 45 days before it is allowed to be made available for actual use by TV bands devices to allow interested parties an opportunity to check that the database is providing accurate results. During the trials, the database administrators will need to provide a means for the Commission and others to enter geolocation data to obtain lists of available channels. The FCC staff will subject each database to inquiries for lists of channels available at specific locations (the specific locations examined will be revealed after testing and will vary across the trials of different database systems). The public also allowed to make such trial inquiries for available channels.

A longer trial period may be required if the OET determines that a database is not in compliance with the Commission's rules. OET will determine the details of each trial (trials will be as consistent as possible across different databases, with the exception of the specific geographic locations of inquiries, but may reflect differences in the design, structures and methodologies used in individual database systems), balancing the need to ensure that the database is working properly with the need to avoid an unnecessarily cumbersome and burdensome process.

¹⁰ We recognize that some of the administrators intend to use subcontractors for various database functions. It is not our intent to interfere with these private arrangements; however, the administrator will be ultimately responsible for the activities of the subcontractor and for ensuring that the subcontractor complies with our rules. The responsible party named by the administrator will be the point of contact for Commission staff. However, responsible parties may, from time to time, have another person member of their organization represent them at a scheduled workshop in their place.

Alaska Science Forum

February 9, 1995

Powerful Radio Signals add Free Soundtrack Article #1221

by Ned Rozell

This column is provided as a public service by the Geophysical Institute, University of Alaska Fairbanks, in cooperation with the UAF research community. Ned Rozell, is a science writer at the institute.

It's one of life's little irritations---I answer my telephone, and the person on the other end sounds a lot like Elvis. Then I realize that a local a.m. radio station is broadcasting an Elvis song, which is somehow being picked up by my phone and competing with the caller for my ear.

How does my phone turn into a radio receiver? I spent four years in the Air Force working on radios, and I remember the receivers as rather large, complicated boxes, crammed with tiny electrical components and a web of wires. My phone doesn't seem that complicated.

According to Robert Hunsucker, a professor emeritus at the Geophysical Institute with the University of Alaska Fairbanks, my phone isn't that complicated, and neither is a receiver circuit. A receiver is so simple, Hunsucker said, that anything from a phone to a person's mouth can act as one.

At its most basic, a receiver circuit consists of only three elements: an antenna, which picks up an electromagnetic radio signal; a detector, which is an electrical component that converts the radio wave to an audio signal the human ear can pick up; and a transducer, which is anything that acts like a speaker.

When I asked him about my phone, Hunsucker correctly deduced that I live close to the transmitter antenna of a local a.m. radio station. Because I live less than a mile away from the station, Hunsucker said I'm in the near-field of the transmitter, an area where the strength of the signal emitted by the radio station is strongest. The near-field is the area within a few

wavelengths of a transmitter antenna---usually within a mile or so depending on the characteristics of the transmitter.

Within the near-field, the radio-frequency signal emitted by the transmitter is so strong that things not designed to be antennas---like telephone wires---can act like them. Hunsucker said radio-frequency waves from the a.m. station probably are traveling over the phone line, into my house, and into my phone.

As the signal instantly reaches the phone, a detector pulls the audio signal off the radio wave. The component acting as a detector in my phone is probably a diode, Hunsucker said. A diode is a semiconductor device, which offers greater resistance to the flow of electrical current in one direction than in the opposite direction. This trait allows a diode (or, in the presence of a very strong radio signal, an overdriven component that acts as a diode) to convert the incoming radio frequency signal into a direct-current voltage.

The direct-current voltage produced by the diode has peaks and valleys that correspond to Elvis's voice and the sound of his backup band. This voltage is felt and expressed by a transducer, which, in the case of my phone, is the little speaker that functions as the ear piece, and I hear the King.

Hunsucker said the problem can sometimes be cured with a radio-frequency filter that can be attached to the phone line. He also said that if the radio signal is very strong, a filter might not be enough.

Such is the extremely rare case when a person's mouth acts as a receiver. The electrical conductivity of the human body can act as an antenna. A metallic filling in a tooth, reacting just so with saliva, can act as a semiconductor to detect the audio signal. The speaker in this case could be anything that vibrates within the mouth enough to produce noise, such as bridgework or maybe a loose filling.

In those cases of extremely strong radio-frequency waves, Hunsucker said the receiver effect can be eliminated by surrounding the bogus receiver with a grounded, copper-screened cage. Or you may choose to sit back and enjoy the music.

Fun Science Index

Main Index

ULS License

Amateur License - AB7VP - Hunsucker, Robert D

Call Sign	AB7VP	Radio Service	HA - Amateur
Status	Active	Auth Type	Regular
Dates			
Grant	04/09/2007	Expiration	06/03/2017
Effective	04/09/2007	Cancellation	

Licensee Information

FRN	0016335267	Type	Individual
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Licensee Name

Hunsucker, Robert D
7917 Gearhart St
Klamath Falls, OR 97601

Amateur Data

Operator Class	Amateur Extra	Prev. Op. Class	Advanced
Group	A	Prev. Call Sign	KL7CYS

Eligibility Code

Trustee/Custodian (for Non-Individuals Only)

Name	Call Sign
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Alaska Science Forum

March 28, 1980

Radiowave Effects on Humans Article #386

by T. Neil Davis

This column is provided as a public service by the Geophysical Institute, University of Alaska Fairbanks, in cooperation with the UAF research community. T. Neil Davis is a seismologist at the institute.

Damaging effect to the human body by radio waves will result if the waves are intense enough to heat up the body. The extreme example is what happens to meat put in a microwave oven.

If a person's body is immersed in a strong radiowave field the electrons and ions in the body try to oscillate in unison with the radiowaves. This means energy is extracted from the radio wave and converted to tiny oscillatory motions of electrically-charged components of the body. The more the motion, the higher the body temperature.

In the Soviet Union, regulations require that workers not be exposed to radiowave radiation in excess of 10 microwatts per square centimeter. One hundred times this radiation level (i.e., 1 milliwatt per square centimeter) will create slight temperature increase in humans, the rise being about the same as results from normal light physical activity. Prolonged exposure to this intensity of radiowave radiation probably causes permanent damage. Exposure to 10 to 100 milliwatts definitely causes damage to the eyes; it cooks the eye lens enough to cause cataracts.

Scientists and the government agencies charged with protecting human health in Western countries are unwilling, so far, to agree with claims by their eastern European and Soviet counterparts that very low microwave levels (10 microwatt to 1 milliwatt) are dangerous. However, they admit that it is an open question.

One reason the question is unanswered is that the energy absorbed by a human from radio

waves depends upon the relationship between the size of the human and the frequency of the radio waves. Just as a TV antenna of the right length and orientation picks up the best signal (the most energy) from a transmitted wave, so it is with a human being. It appears that the cranial cavity of a mammal will resonate at specific radio frequencies determined by the size of the brain cavity. At these resonant frequencies the human head will absorb vastly more radiowave energy than it will at other nearby frequencies.

An adult's head will resonate at a frequency between 350 and 400 MHz (megahertz). Being smaller, a child's head will resonate at a higher frequency, somewhere between 600 and 850 MHz. Since each individual may have his or her own resonant frequency, a particular frequency radiowave might affect one person more than another. Consequently, testing on humans--even if people are willing to let this happen--can be rather complicated.

Aside from the question of permanent damage by absorption of too much radiowave energy, there is the issue of how much radiation it takes to temporarily modify human behavior or mental ability. It is suspected that a microwave signal modulated (i.e., pulsed) at the frequencies where human brainwaves operate (1 to 20 Hz) may affect mental processes, even if the radiation is too weak to create substantial heating of the brain.

Quite obviously it is a complicated issue to determine the effects of radiowaves upon humans and other animals. Just knowing the strength of the radio signal a person is immersed in is not enough. Critically important may be the frequency match between the signal and the person's body and whether or not the signal is modulated at a frequency that could match up to a person's brainwave pattern.

Complicating matters even further is the finding that mammals can be made to "hear" pulses of radiowave emission. Pulses at frequencies within a mammal's hearing range can cause periodic healings of the head. These create pressure pulses in the ear that are interpreted as sound. Further, some studies have indicated radiowave effects upon cell processes that could affect the nervous system, the cardiovascular system and immunity to disease. The effects are not necessarily all bad: certain cancers are being successfully treated with radiowaves, and the future of even greater success looks bright.

Health Index

Main Index

Exhibit D

1. US Patent #7056431 Method for electrochemical analyses (Citing)
2. US Patent #4512744 Method enabling rapid identification of humans and animals (Citing)



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United States Patent
Schroder, et al.

7,056,431
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Method for electrochemical analyses

Abstract

Dental amalgam as an electrode material in voltammetry is provided having a very high overpotential to hydrogen. Accordingly, trace analyses can be carried out at potentials sufficiently negative to allow determination of e.g. zinc, cobalt, nickel and iron at trace levels. Such analyses have not previously been possible except by using a mercury or a mercury film electrode. Such determinations are very important for field and online analyses of pollutants in soil and groundwater, and the electrode can be used repeatedly.

Inventors: Schroder; Knut (Trondheim, NO), Mikkelsen; Oyvind (Kattum, NO)
 Appl. No.: 10/257,443
 Filed: April 9, 2001
 PCT Filed: April 09, 2001
 PCT No.: PCT/NO01/00155
 371(c)(1),(2),(4) August 19, 2003
 Date:
 PCT Pub. No.: WO01/80328
 PCT Pub. Date: October 25, 2001

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Current U.S. Class:
 Current International Class:
 Field of Search:

205/789 ; 205/775
 G01N 27/333 (20060101)
 204/416-420,431,403,01,400,280,291,292,293 205/775,789,794.5

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Primary Examiner: Noguera, Alex
 Attorney, Agent or Firm: Wenderoth, Lind & Ponack, LLP

Claims

What is claimed is:

1. A method comprising: performing voltammetric analysis by using an electrode system comprising at least one electrode, wherein a working electrode material of the at least one electrode consists of a silver-mercury amalgam in a solid state.
2. The method according to claim 1, wherein the silver-mercury amalgam comprises one part pure silver crystals for dental use and approximately 0.55 parts analytical grade mercury.
3. The method according to claim 2, wherein the electrode system comprises a plurality of electrodes, wherein the voltammetric analysis involves a redox reaction at an electrode surface, using an analysis cell and the plurality of electrodes arranged in the analysis cell, wherein the analysis cell is filled with a solution to be analyzed through production of a measuring signal as a consequence of the redox reaction, and wherein the measuring signal is a measure of the concentration of a component in the solution.
4. The method according to claim 2, wherein the voltammetric analysis is a differential pulse anodic stripping type voltammetry.
5. The method according to claim 4, wherein the electrode system comprises a plurality of electrodes, wherein the voltammetric analysis involves a redox reaction at an electrode surface, using an analysis cell and the plurality of electrodes arranged in the analysis cell, wherein the analysis cell is filled with a solution to be analyzed through production of a measuring signal as a consequence of the redox reaction, and wherein the measuring signal is a measure of the concentration of a component in the solution.
6. The method according to claim 1, wherein the voltammetric analysis is a differential pulse anodic stripping type voltammetry.
7. The method according to claim 6, wherein the electrode system comprises a plurality of electrodes, wherein the voltammetric analysis involves a redox reaction at an electrode surface, using an analysis cell and the plurality of electrodes arranged in the analysis cell, wherein the analysis cell is filled with a solution to be analyzed through production of a measuring signal as a consequence of the redox reaction, and wherein the measuring signal is a measure of the concentration of a component in the solution.
8. The method according to claim 1, wherein the electrode system comprises a plurality of electrodes, wherein the voltammetric analysis involves a redox reaction at an electrode surface, using an analysis cell and the plurality of electrodes arranged in the analysis cell, wherein the analysis cell is filled with a solution to be analyzed through production of a measuring signal as a consequence of the redox reaction, and wherein the measuring signal is a measure of the concentration of a component in the solution.

Description

This application claims priority under 35 U.S.C. 371 from PCT/NO01/00155, which was filed on Apr. 9, 2001.

BACKGROUND OF THE INVENTION

The present invention relates to an electrode for use in electrochemical analysis.

Since the development of polarography by Professor J. Heyrovsky in 1922, liquid mercury and liquid diluted mercury amalgams have been superior as an electrode material for the use of voltammetry for analytical purposes. This is mainly due to the high overvoltage to hydrogen, which enables the use of a wide potential range for the measurements. A typical example is the determination of zinc, this being virtually impossible without using a mercury, or a mercury film electrode.

Due to the toxicity of mercury and liquid diluted mercury compounds, the use of such compounds is increasingly restricted, and cannot be included in voltammetric devices for field and online applications.

SUMMARY OF THE INVENTION

The properties of dental amalgam as an electrode material in voltammetry have been studied. It was found that dental amalgam has a very high overpotential to hydrogen, allowing trace analyses to be carried out at potentials sufficiently negative to allow determination of e.g. zinc, cobalt, nickel and iron at trace levels. This has not previously been possible except by using a mercury or a mercury film electrode. Such determinations are very important for field and online analyses of pollutants in soil and groundwater, and the electrode can be used repeatedly. The electrode is also solid.

Silver and mercury are the main components of dental amalgam. However, commercial dental alloy has some tin, copper and zinc content in order to improve the mechanical properties for dental use. A pure silver amalgam can be used to avoid interferences.

The electrodes can be produced using techniques well established in dental practice.

Due to the special properties of dental amalgam compared with mercury itself, its toxicity is very low, although its use in the mouth is somewhat disputed. As no increased amount of mercury is reported in the groundwater close to cemeteries, the use of such small electrodes for soil and groundwater analyses are obviously without any hazard.

The present analyses describe such electrodes and some preliminary practical applications for trace heavy metal analyses, using differential pulse stripping voltammetry. This enables the determination of, for example, zinc in the concentration level less than 10 ppb. Further improvements can obviously be obtained by optimizing the composition of the alloy and the electrolyte, and by the application of sound to the electrode system (Application of sound to an electrode system is described in the inventors' Norwegian patent application number 1999 1814.)

In a first aspect of the present invention there is provided an electrode for use in electrochemical analysis, where the electrode comprises amalgam in a solid state.

In a second aspect of the invention there is provided a means for performing electrochemical analyses involving a redox reaction at an electrode surface, comprising an analysis cell, a system of electrodes arranged in the analysis cell filled with a solution to be analyzed through production of a measuring signal as a consequence of a redox reaction at the electrodes, wherein the measuring signal is a measure of the concentration of a component in the solution, and where at least one of the electrodes comprises amalgam in a solid state.

The amalgam may be any solid amalgam to be approved to be at least in the same environmental safety level as the requirements for dental use. The electrode may be in the form of a ceramic rod enclosing the amalgam, and with a copper wire for electrical connection. The amalgam in the electrode may be made using methods familiar in dental techniques.

The electrode may be used as a measuring electrode in voltammetric analysis, especially differential pulse anodic stripping voltammetry.

The invention is stated in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention will now be described in the following with reference to the accompanying drawings, where

FIG. 1 shows a three-electrode system;

FIG. 2 is a cross-sectional view of a solid electrode according to an embodiment of the invention;

FIG. 3 is a graph showing a voltammetric scan of a 30 years old tooth filling in KNO₃ sub.3 (0.1M) solution;

FIG. 4 is a voltammogram showing the detection of zinc on a working electrode containing a non-zinc amalgam for dental use;

FIG. 6 is a graph showing peak current for zinc as a function of concentration for the experimental conditions in FIG. 4; and

FIG. 8 is a voltammogram of a simultaneous detection of zinc, cadmium and lead.

DETAILED DESCRIPTION OF THE INVENTION

A. Experimental

The analyses were performed as differential pulse anodic stripping voltammetry, using a three-electrode system as shown in FIG. 1. The three electrodes in FIG. 1 are an indicator electrode, which is the dental amalgam electrode, a counter electrode and a reference electrode. The three-electrode system is immersed in an electrolyte. The three-electrode system is connected to a potentiostat. The potentiostat is connected to a computer. The voltammetric equipment is a digital device that can perform all modes of voltammetry.

The counter electrode was a platinum wire and potentials were measured vs. a silver/silver chloride/saturated silver chloride/saturated potassium chloride reference electrode.

The working electrode was a silver amalgam electrode as illustrated in FIG. 2. Three types of dental amalgams were investigated:

1. The initial experiments were performed by using an amalgam tooth filling about 30 years old, which was attached to a copper wire with silver epoxy, the than sealed in cement (from T+F GmbH). The copper wire was connected to the voltammetric equipment. These experiments were carried out to study if the dental amalgam showed overpotential to hydrogen. The analyses were performed by differential pulse anodic stripping voltammetry in KNO_3 sub.3 (0.1 M, 100 ml) solution that was purged with nitrogen (10 min) prior to the analyses.
2. The second silver amalgam electrode was prepared by the following procedure using the facilities in a dental clinic: Equal amounts of analytical grade mercury were mixed with high copper non-gamma 2-alloy for dental use (ARDENT FUTURA, AB Ardent, Marsta Sweden). The non-gamma 2 alloy consists of 44.5% silver, 30.0% tin and 25.5% copper. A Dentomat 2 Degussa amalgam mixer for dental use was employed for mixing the amalgam. The amalgam was forced into an inert ceramic rod by an amalgam gun (No. 940, Hawe Neos Dental), in a way similar to the technique used for dental fillings, and sealed around a copper wire as shown in FIG. 2. The copper wire was connected to the voltammetric equipment. The experiments using this electrode were carried out to prove if it was possible to detect zinc at a non-zinc dental amalgam electrode. If it was found that zinc could be deposited and detected voltammetrically by using this electrode, this would also indicate that other heavy metals could be detected by use of a pure silver dental amalgam. The analyses were performed as differential pulse anodic stripping voltammetry in $\text{NH}_4\text{sub.4Ac}$ (0.05 M, 100 ml) solution. The solution was purged with nitrogen (10 min) prior to the analyses to avoid any disturbance of oxygen.
3. The third silver amalgam electrode was prepared by mixing one part of pure silver crystals for dental use (particle <50 μm) with 0.65 parts analytical grade mercury, using a mortar. Immediately after mixing the amalgam was pressed into a ceramic rod with an amalgam gun as described above. Analyses were performed by differential pulse anodic stripping voltammetry in $\text{NH}_4\text{sub.4Ac}$ (0.05 M, 100 ml). These analyses were done to prove if it was possible to detect heavy metals, for instance zinc, cadmium and lead, on the dental amalgam electrode using a silver amalgam free from impurities like copper and zinc.

The three types of working electrodes were polished once before the experiments using a fine soft sandpaper, and washed in water purified by Millipore Elix and then with Millipore Milli-Q Gradient system (Millipore Corporation, SA 67120 Molsheim France). Also standard solutions were made by use of water from this water purification system. All reagents were of analytical reagent grade quality.

B. Results

The results will be divided into three sections, dealing with the respective working electrode used.

1. Initial results from using the 30 year old tooth filling as a working electrode.

Some voltammetric scans were performed initially to find if the dental amalgam showed overvoltage to hydrogen to allow the use of a wide potential range. As explained under the experimental section, a thirty year old tooth filling was used as a working electrode in a voltammetric arrangement. The typical voltammogram obtained in a KNO_3 sub.3 (0.1 M, 100 ml) solution is shown in FIG. 3. The voltammetric scan in FIG. 3 shows current (100 nA) as a function of potential (mV) and was performed with a scan rate of 10 mV/sec and pulse height 25 mV.

As shown in FIG. 3, the dental amalgam possess the property of a greater overvoltage against hydrogen. The peaks observed are reflecting the composition of the tooth filling, presumably corresponding to zinc, tin, copper and silver, from left to right. If the scan had been extended to around +300 mV, a peak for mercury would probably also appear.

2. Results from analyses using a non-zinc (high copper non-gamma 2-alloy) amalgam for dental use as a working electrode

Analyses in order to prove if it was possible to detect heavy metals on an electrode consisting of a non-zinc (high copper non-gamma 2-alloy) amalgam for dental use was performed. Analyses of zinc in the range from 100 $\mu\text{g/l}$ to 1500 $\mu\text{g/l}$ in $\text{NH}_4\text{sub.4Ac}$ (0.05 M) solution was carried out. Differential pulse anodic stripping voltammetry with a scan rate of 10 mV/sec, pulse height 70 mV, and a 120 seconds deposition time was used.

FIG. 4 shows a voltammogram where zinc was added successively to the $\text{NH}_4\text{sub.4Ac}$ solution. In FIG. 4, current (100 nA) is shown versus potential (mV).

As seen in FIG. 4, the addition of zinc resulted in a corresponding increase in the current signal. FIG. 5 shows a plot of the peak current (μA) as a function of zinc concentration ($\mu\text{g/l}$). The peak current is corrected for a 1.5 μA offset. As shown, there is a good linearity ($R_{\text{sup.2}}=0.99$) between the variables. The experimental conditions were as in FIG. 4.

The results obtained in this section prove that zinc can be detected on the dental amalgam electrode. These results also indicate that an analogous situation will appear for other heavy metals, like cadmium, lead and copper.

The reproducibility was investigated by performing two parallels and is shown in Table 1. Table 1 shows analyses of zinc on dental amalgam electrode, two parallels. The table shows the current values (corrected for offset) obtained in each parallel. Also the average response, the standard deviation and the relative standard deviation are listed in the table.

TABLE-US-00001 TABLE 1 Concen- Avg. Std. Relative tration Response Response resp. deviation std. deviation $\mu\text{g/l}$ μA μA μA μA (%) 500 12 1 11.0 11 6 0.8
6.9 1000 22.9 20.3 21.6 1.7 8.0 1500 35.7 32.2 33.9 2.5 7.3

As seen in Table 1, there is a relative standard deviation of about 75%. This is good with a view that the electrode surface of the working electrode only was polish with soft sandpaper.

3. Results from analyses using a dental amalgam with pure silver only as a working electrode in voltammetry

Some analyses were performed to investigate the use of a pure silver amalgam as a working electrode material. Some simultaneous analyses of zinc, cadmium and lead were performed. The given metals are in the range from 100 $\mu\text{g/l}$ to 150 $\mu\text{g/l}$ in $\text{NH}_4\text{sub.4Ac}$ (0.05 M) solution. Differential pulse anodic stripping voltammetry with a scan rate of 10 mV/sec, pulse height 100 mV, and 180 seconds deposition time was applied. A typical plot of the given voltammogram with current (μA) as a function of potential (mV) is shown in FIG. 6 for the simultaneous detection of 150 $\mu\text{g/l}$ zinc (Zn), 100 $\mu\text{g/l}$ cadmium (Cd) and 100 $\mu\text{g/l}$ lead (Pb) is plotted.

CONCLUSIONS

From the given results it is found that a working electrode consisting of dental amalgam can be used in voltammetry for detection of heavy metals and other species in $\mu\text{g/l}$ levels. Further improvements can obviously also be obtained by optimising the composition of the alloy and the electrolyte, and by application of sound to the electrode system (Ref. Patent application 1999 1814, Norway).

Dental amalgam has many properties making it a preferable material for electrode use in voltammetry. It has a high overvoltage against hydrogen and this enables one to determine several compounds which previously could not be determined except by using a mercury electrode. It is a solid material, and this makes it possible to be used in online analyses in the field. It can also be used repeatedly over a long period of time without any maintenance, which is essential for an online and a field apparatus.

The toxicity of dental amalgam is not greater than that people can live with it inside their mouth for a whole life without any poisoning effects, and its use is without any formal environmental restrictions. Also in an electrode the amount of an amalgam will be much lower than the amount used in a tooth filling. Moreover, as no increased amount of mercury is reported in the groundwater close to cemeteries, the use of such small electrodes for soil and groundwater analyses are obviously without any hazard.

Finally, it is easy and cheap to manufacture such electrodes, using techniques well established for dental clinics.

having described preferred embodiments of the invention it will be apparent to those skilled in the art that other embodiments incorporating the concepts may be used. These and other examples of the invention illustrated above are intended by way of example only and the actual scope of the invention is to be determined from the following claims.

♦ ♦ ♦ ♦ ♦

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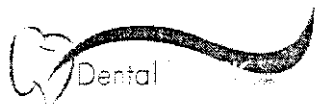
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United States Patent
Michnick, et al.

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April 23, 1985

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Method enabling rapid identification of humans and animals

Abstract

Message identifying information in available microdot format is applied to a tooth preparation of a prescribed depth, where it can be easily coated over with a clear composite, yet still readable by appropriate scanning devices.

Inventors: Michnick; Bruce T. (Plainview, NY); Kitzis; Stanley (Woodbury, NY)
Assignee: Dentistry Researchers & Designers, Inc. ()
Appl. No.: 06/546,375
Filed: October 23, 1983

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Current U.S. Class:
Current International Class:

433/229, 433/215
A61C 5/00 (20060101); A61B 5/117 (20060101); A61B 19/00 (20060101); A61C 003/00 (); A61B
001/24 ()
433/215, 229

Field of Search:

References Cited

U.S. Patent Documents

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4439154

April 1981
March 1984

Samis
Mayclin

Primary Examiner: Peshock, Robert
Attorney, Agent or Firm: Brodsky, Charles i.

Claims

We claim:

1. A method enabling identification of human and animal subjects, comprising the steps of:
 - a. first, permanently affixing an indicia of identification information at a location within a face surface of a tooth of the subject which can be viewed by another looking into the subject's mouth; and
 - b. second, electronically scanning said identifying indicia from outside the subject's mouth, for non-destructively put-putting the information thereby stored thereon.
2. The method of claim 1 wherein said first step affixes a microdot to said tooth face surface containing the information indicia pertaining to the subject to be identified.
3. The method of claim 1 wherein said first step affixes the information indicia to said tooth face surface to a predetermined depth.
4. The method of claim 3 wherein said first step includes the sub-steps of:
 - a. first, prepsring a cavity within said tooth face surface to receive said information indicia at said predetermined depth;
 - b. second, placing said information indicia within said cavity;

c. third layering a clear composite material over said indicia to protect said indicia and to fill the cavity so formed.

5. The method of claim 4 wherein said first sub-step includes the step of using a self-limiting dental drill to prepare said tooth face cavity of a size corresponding to that of said information indicia.

6. The method of claim 4 wherein said second sub-step includes the step of cleansing said information indicia of contamination prior to the layering thereover of said composite material in said third sub-step.

Description

FIELD OF THE INVENTION

This invention relates to the science of identification, in general, and to a method for rapidly identifying humans and animals, in particular.

BACKGROUND OF THE INVENTION

As is well known and understood, several methods are employed in identifying the remains of those killed in accidents, disasters, and/or natural and man-made cataclysmic holocausts. If photographs are not helpful, resort is often made to the use of fingerprints as a means of identification--but the problem with that is that those whose fingerprints are on file represent only an infinitesimal number of persons, and the fingerprinting of school-age children is just beginning, although continuing to be met with resistance. Dental records are employed, but only after some idea exists as to the identity of the person sought to be substantiated, and, really, of limited usefulness. While the use of "dog-tags" in the military continues to be a common practice, instances often arise where the "dog-tags" are destroyed, missing, or otherwise not available for purposes of identification.

And, no matter what the above restrictions offer as regards the identification of humans, the identification of animals is a far greater problem. Besides the issuance of license tags--except for photographs of the animals in question, or the availability of other visual indicia--the only technique usually available involves a process of "branding", limited to race-horses and cattle, in general.

DETAILED DESCRIPTION OF THE INVENTION

In accordance with the method of the invention, microdot technology is combined with readily available and understood dental techniques in applying the message identifying information characteristics to a tooth preparation in simple, inexpensive manner. In accordance with present day techniques, the microdot can have inscribed upon it any and all information pertaining to the human or animal--such as social security numbers, name, address and telephone information, fingerprint designations, health information, serial numbers for animals, and any other indicia of identification desired. Such information can be inscribed on a microdot in any available technology--such as with alpha-numerics, strip, disc or bar-line codes--, and can be inscribed on either a plastic, paper, or metal disc of an approximate 4 millimeter size. In a preferred embodiment of the present invention, such encoded disc is embedded in prescribed manner on the tooth of the human, or animal, with a lower right molar in humans being particularly attractive. Such attractiveness results from the ease in which visual scanners, and/or laser-beam techniques can be utilized in "reading" the information on the tooth face.

In carrying out the method of the invention, a self-limiting dental drill is utilized, corresponding to the size of the microdot or microdisc. With such drill, the tooth face can be prepared to a predetermined depth of an amount requiring no anaesthesia. Although a dental drill is especially easy for preparing an initial cavity for the insertion of the information disc, other preparation techniques may be employed--e.g. the use of laser beams, ultrasonic drilling, etc.

Once the drilling or other means has been utilized to provide the depth required, a standard "acid-etching technique" can be utilized, in which an acid (typically 35% to 50% stabilized phosphoric acid) is applied to the area in question for approximately 60 seconds. After washing with water and drying, the disc can be placed in the prepared area under contamination free conditions. Once the disc is allowed to dry, a layer of clear, composite material can be applied to cover the informational disc and to fill the cavity established. Such a composite resin thus embeds the disc in the tooth, to become a permanent identification record. One such composite resin which can be employed is marketed under the brandname "COMPLUS", by the Parket Company of Farmingdale, N.Y. Such composite, however, can be any appropriate white light cured material, or a catalyst, e.g. BIS GMA, induced composite.

When so prepared, the tooth--be it of a human or of an animal--is marked for life. If an occasion thereafter arises by which some means of identification is required, an available scanning technique, even using handheld apparatus, can be employed. Dependent upon the information imparted to the microdot or other informational disc, an investigator can identify the individual, and can be provided with other emergency information, as medical status, allergy information, persons to contact in cases of emergency, etc., as well as all the identification information alluded to above. As will be seen, depending upon what is to be imparted to the disc implanted in either the human or animal tooth, the benefits to be derived are numerous, with but a simple technique which, at the same time, is cost effective. The ability to gather this kind of information in a quick, efficient manner, will give advantages which will be readily available to those to whom such information is useful.

While there has been described what is considered to be a preferred embodiment of the present invention, it will be readily appreciated by those skilled in the art that modifications can be made without departing from the scope of the teachings herein. For example, although the invention has been described in the context of the utilization of a microdot or other informational disc, it will equally be seen that the information indicia can be incorporated as part of a computer chip, or magnetic tape, as well as of other materials as well. Similarly, although a preferred form of the invention envisions the placement of such information on the "cheek" side of a tooth, it will be appreciated that the incorporation could be on the "tongue" side of the tooth, and still operate in accordance with the invention. And, it would be equally clear that the information indicia could be affixed not only to a "real" tooth--but, in the case of humans, could be implanted in connection with usage in a denture or in a crown, depending upon the particular findings in the patient's mouth. For at least such reasons, therefore, resort should be had to the claims appended hereto for a correct understanding of the breadth of its coverage.

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